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मानक

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“जानने का अधिकार, जीने का अधिकार”

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“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 5342 (1996): Ascorbic Acid, Food Grade [FAD 8: Food Additives]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक
एसकोर्बिक अम्ल, खाद्य ग्रेड — विशिष्टि
(पहला पुनरीक्षण)

Indian Standard
ASCORBIC ACID, FOOD GRADE —
SPECIFICATION
(*First Revision*)

ICS 67.220.20

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Food Additives Sectional Committee had been approved by the Food and Agriculture Division Council.

With the increased production of processed foods, manufacturers have started adding a large number of substances, generally in small quantities, to improve the appearance, flavour, texture or storage properties, and in some cases to enhance the nutritive value of the processed foods. As certain impurities in these substances have been found to be harmful, it is necessary to have a strict quality control of these food additives. A series of standards was, therefore, prepared by this Bureau to cover purity and identification of these substances. It is hoped that these standards would help in checking purity which requires to be checked at the stage of manufacture, for it is extremely difficult (and in many cases impossible) to detect the impurity once these substances have been added to the processed foods. Besides, these standards are intended to guide the indigenous manufacturers in making their product conform to specifications that are accepted by scientists, health authorities and international bodies, and the consumer industries to use them within the quantity permitted by the health authorities.

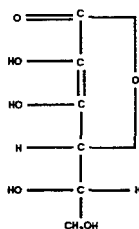
Ascorbic acid, food grade used as a food additive is permitted under *Prevention of Food Adulteration Rules*, 1955. These rules, *inter-alia* prescribe:

'The food additives permitted for use in certain foods shall be sold only under the BIS Certification Mark'. Ascorbic acid, food grade, is one such item.

This standard was first published in 1968 and is being revised to incorporate the following additions/changes:

- To bring the requirement of solubility under description section to make it in line with the food chemical codex NRC.
- To provide requirement for the heavy metals and the corresponding test method.
- To include instruction for storage and expiry date under marking clause.
- To align the specific rotation requirement with food chemical codex.

Chemical Names — Ascorbic acid; *L*-ascorbic acid, 3-keto-*L*-gulofuranolactone. Its empirical formula is $C_6H_8O_6$ and molecular weight is 176.13. Structural formula of ascorbic acid is:



A considerable amount of assistance has been derived from the following publications in preparing this standard:

Specification for identity and purity of food additives. Vol I Antimicrobial preservatives and antioxidants 1962. Food and Agricultural Organization of the United Nations, and the World Health Organization, Rome.

India, Ministry of Health, Pharmacopoeia of India — 1966.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2:1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

ASCORBIC ACID, FOOD GRADE — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements and the methods of test for *L*-ascorbic acid, food grade.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

<i>IS No.</i>	<i>Title</i>
1070:1992	Reagent grade water (<i>third revision</i>)
1699:1995	Methods of sampling and test for synthetic food colours (<i>second revision</i>)
4750:1996	Sorbitol powder, food grade (<i>first revision</i>)
4818:1996	Sorbic acid, food grade (<i>first revision</i>)

3 DESCRIPTION

Ascorbic acid shall be a white or almost white, odourless crystalline solid. Its melting range is 190°C to 192°C with decomposition. The material is freely soluble in water and sparingly soluble in ethanol and insoluble in ether.

NOTE — The solubility is intended only as information regarding approximate solubility and is not to be considered as a quality requirement and is of minor significance as a means of identification or determination of purity and dependence must be placed on other specifications.

4 REQUIREMENTS

4.1 Identification

4.1.1 To 2 ml of a 2 percent solution add a few drops of sodium nitroferricyanide followed by 1 ml of approximately 0.1 N sodium hydroxide. A transient blue colour shall be produced immediately.

4.1.2 When to 2 ml of 2.0 percent solution in water of the material are added, 2 ml of water, 0.1 g of sodium bicarbonate and about 0.02 g of ferrous sulphate, mixture is shaken and allowed to stand, a deep violet colour shall be produced which shall disappear on the addition of 5 ml of dilute sulphuric acid.

4.1.3 Solution of ascorbic acid in ethanol shall decolourise a solution of 2,6-dichlorophenol-indophenol.

4.2 Specific Rotation

When determined in a 2 percent (*m/v*) solution in water at 20°C, specific rotation shall be between +20.5° to +21.5° under sodium light.

4.3 pH of 2 percent (*m/v*) solution shall be between 2.4 and 2.8.

4.4 The material shall also conform to the requirements given in Table 1.

5 PACKING, STORAGE AND MARKING

5.1 Packing

The material shall be securely packed in containers with minimum access to light and air. The containers shall be such as to preclude contamination of the contents with metals or other impurities.

5.2 Storage

The material shall be stored in a cool and dry place so as to avoid excessive exposure to heat.

5.3 Marking

5.3.1 Each container shall be legibly and indelibly marked with the following information:

- a) Name of the material, including the words 'Food Grade';
- b) Name and address of the manufacturer;
- c) Net content, when packed;
- d) Batch or code number;
- e) Date of manufacture;
- f) Instructions for storage;
- g) Expiry date; and
- h) Any other requirements as specified under the *Standards of Weights and Measures (Packaged Commodities) Rules, 1977/Prevention of Food Adulteration Rules, 1955.*

5.3.2 BIS Certification Marking

The product may also be marked with the Standard Mark.

5.3.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Table 1 Requirements for L-Ascorbic Acid, Food Grade
(Clause 4.4)

Sl No.	Characteristic	Requirement	Method of Test, Ref to	
			Annex of this Standard (4)	Other Standards (5)
(1)	(2)	(3)	(4)	(5)
i)	Purity as $C_6H_8O_6$, percent by mass, <i>Min</i>	99	A	—
ii)	Loss on drying over sulphuric acid for 24 hours, percent by mass, <i>Max</i>	0.4	—	Method II of Annex C of IS 4818:1996
iii)	Sulphated ash, percent by mass, <i>Max</i>	0.1	—	Annex A of IS 4750:1996
iv)	Arsenic (as As), mg/kg, <i>Max</i>	3	—	Cl 15 of IS 1699:1995
v)	Heavy metal (as Pb), mg/kg, <i>Max</i>	20	B	—

6 SAMPLING

The representative samples of the material shall be drawn according to the method prescribed in 4 of IS 1699:1995.

7 QUALITY OF REAGENTS

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070:1992) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

ANNEX A

[Table 1, Sl No. (i)]

DETERMINATION OF PURITY

A-1 DETERMINATION OF PURITY

A-1.1 Reagents

A-1.1.1 Sulphuric Acid — 90 percent (*m/m*), and 2 N.

A-1.1.2 Iodine Solution — 0.1 N.

A-1.1.3 Starch Solution

Triturate 0.5 g of starch (potato starch, maize starch or soluble starch) with 5 ml of water and add this, stirring constantly, to sufficient water to make up about 100 ml. Boil for a few minutes, cool and filter. Starch solution shall be freshly prepared.

A-1.2 Apparatus — Vacuum desiccator.

A-1.3 Procedure

Dissolve about 400 mg of accurately weighed ascorbic acid, previously dried in a vacuum desiccator over sulphuric acid for 3 hours, in a mixture of 100 ml of carbon dioxide-free water and 25 ml of dilute sulphuric acid. Titrate the solution at once with 0.1 N iodine, adding a few drops of starch as indicator as the end point is neared. Each millilitre of 0.1 N iodine is equivalent to 0.008 806 g of $C_6H_8O_6$.

ANNEX B

[Table 1, Sl No. (v)]

DETERMINATION OF HEAVY METALS

B-1 PROCEDURE

Proceed as given in 16 of IS 1699:1995 using 4 ml

of standard lead solution (equivalent to 40 µg/ml) in the preparation of Solution A, and 1 g of sample in the preparation of Solution B.

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This Indian Standard has been developed from Doc : No. FAD 8 (471).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 323 01 31, 323 8575, 323 9402

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :

Telephone

Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	3237617 323 3841
Eastern	: 1/14 C.I.T. Scheme VII M, V.I.P. Road, Maniktola CALCUTTA 700054	337 8499 337 8561 338626, 339120
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160022	60 3843 60 2025
Southern	: C.I.T. Campus, IV Cross Road, MADRAS 600113	235 0216, 235 0442 235 1519, 235 2315
Western	: Mankalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	832 9295, 832 7858 832 7891, 832 7892
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AMENDMENT NO. 1 FEBRUARY 2005
TO
IS 5342 : 1996 ASCORBIC ACID, FOOD GRADE —
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(First Revision)

[*Page 2, Table 1, Sl No. (i), col 2*] — Substitute 'Purity, as $C_6H_8O_6$, percent by mass, on dry basis, *Min*' for 'Purity, as $C_6H_8O_6$, percent by mass, *Min*'.

[*Page 2, Table 1, Sl No. (v), col 3*] — Substitute '10' for '20'.

(FAD 8)

Reprography Unit, BIS, New Delhi, India